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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,619	09/14/2004	Giangiacomo Torri	5497	4010

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EXAMINER	
LAU, JONATHAN S	
ART UNIT	PAPER NUMBER
1609	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/506,619	TORRI ET AL.	
	Examiner	Art Unit	
	Jonathan S. Lau	1609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 10-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 10-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2 pages/September 14, 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The instant application is the national stage entry of PCT/EP03/02910, filed March 20, 2003, and claims benefit of foreign priority document EPO 02425172.0, filed March 20, 2002. Claims 1-8 and 10-14 are pending and examined on the merits herein.

Specification

The abstract of the disclosure is objected to because of a minor spelling or grammatical error on the first line, "method for functionalizing polysaccharides using a source or free radicals...". Correction is required. See MPEP § 608.01(b).

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
    (1) Field of the Invention.
    (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a

> nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

The disclosure is objected to because of the following informalities: the section headings appear in bold type and in both capitals and lower case letters, minor grammatical errors such as "a new process for introducing functional groups on a large varieties of polysaccharides" on page 1 lines 3-4 and "studies have shown that it is of great importance the etherification and esterification of cellulose with functional groups" on page 1 lines 25-26, and use of the term "thelomeric" on page 3 line 21 which is not defined by Applicant and possesses no widely accepted definition.

Appropriate correction is required.

Information Disclosure Statement

The information disclosure statement filed September 14, 2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites "the polysaccharide is selected from the group consisting of flax, cellulose, viscose and cotton". While cellulose and viscose are polysaccharides, flax and cotton are plant materials that are not wholly identifiable as a polysaccharide. It is unclear what polysaccharide Applicant is claiming when selecting the polysaccharide to be "flax" or "cotton". The failure of Applicant to distinctly claim the subject matter which Applicant regards as the invention renders the claim 4 vague and indefinite. Claims 5 and 6 depend from and incorporate all the limitations of claim 4, and are rendered vague and indefinite for the same reason.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 10, 11, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Ward et al. (Surface Science, 1978, p257-273, cited in PTO-892).

Ward et al. disclose the use of cold plasma to generate free radical active centers within the cellulose matrix of cotton cellulose in the form of fibers in cotton print cloth. See Ward et al., page 258, lines 2-5, 14, and 25. This is the formation of a free radical on a polysaccharide chain that is cellulose in the form of a fiber used together

with one or more natural cotton cellulose fibers. Ward et al. further disclose the radicals can react absent the radical source, "polymerizations can be initiated either by the simultaneous presence of monomer and cotton fabric in the plasma, or by direct contact between previously activated cotton and monomers." Ward et al. disclose the reaction between styrene, a functionalized olefin, and cellulose, and the product formed thereof. See Ward et al., page 271, lines 3, 4, 6, 7, and 18 and table 9, entry 3. Ward et al. further disclose that the stable radical has a half-life of about 1 day, "the singlet remains even after 24 h exposure to room atmosphere, showing that the radical is long-lived." See Ward et al., page 266, lines 6-9.

Claims 1-5 and 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Zara et al. (Tappi Journal, 1995, p131-134, cited in PTO-892).

Zara et al. disclose pulp cellulose fiber forms free radicals generated Fe^{2+}/H_2O_2, Fenton's reagent, which is followed by the addition of vinyl acetate, a functionalized olefin. See Zara et al., page 131, left column, lines 20-23 and middle column, lines 13-18 and page 134, middle column, lines 31-33 and 39-41. Zara et al. disclose the grafting of cellulose pulp used in the paper industry, wherein the cellulose pulp fibers are used together with other cellulose pulp fibers to make paper. See Zara et al., page 131, middle column, lines 3-6. The radical is formed by consumption of the Fe^{2+}/H_2O_2 reagent that is the radical initiator, to "create active centers by abstracting an active hydrogen from the backbone polymer chain" which may be propagated by growing poly(vinyl)acetate radicals, such that the propagated free-radical reaction occurs in the

absence of the consumed Fe^{2+}/H_2O_2 radical source. See Zara et al., page 133, left column, lines 5-10 and center column, lines 4-7. Zara et al. further disclose the cellulose graft polymer produced by these methods at different amounts of monomer grafted onto the cellulose backbone as data points plotted on graphs. See, for example, Zara et al., page 132, figures 1, 2, 3, and 4. The G% along the vertical axis of the graphs in the figures is calculated by the formula on page 134 right column, lines 4-9, G% = [(M2-M1)]/M1 * 100%, where M2 is the mass of the graft polymer product and M1 is the mass of cellulose. A G% of 100 corresponds to a ratio mol olefin/eq anhydrous glucose of approximately 1. Data points corresponding with individual polymers with this G% value are present in figures 2, 3 and 4, anticipating the range of ratios mol olefin/eq anhydrous glucose in the instant application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burke, N. and Guillet, J. (Canadian Patent CA 2,249,955, cited in PTO-892) in view of Krässig (Sven Papperstidn, 1971, p417-428, cited in PTO-892)

Burke, N. and Guillet, J. disclose the formation of carbon-centered free radicals on a polymer, attaching stable free radicals to the free radical sites and effecting controlled graft polymerization at the sites of attachment, absent the source of the radicals that generated the original free radical sites. See Burke, N. and Guillet, J., page 8, lines 19-22 and 24-32. The free radicals are generated on the backbone polymer and may be generated radiochemically using gamma rays from a cobalt-60 source or chemically using Fenton's reagent. See Burke, N. and Guillet, J., page 6, lines 10-11, 18, and 24-26. The graftable monomers that functionalize the polymer are functionalized olefins, for example acrylic acid disclosed on Burke, N. and Guillet, J., page 8, lines 12-14. In one embodiment the polymer samples are exposed to 2 Mrads of gamma rays from a ^{60}Co source, a dose equivalent to 20 kGy. See Burke, N. and Guillet, J., page 13, line 33-34.

Burke, N. and Guillet, J. disclose a list of polymers for use with this method including the carbohydrate polymer cellulose. See page 6, line 1. However, Burke, N. and Guillet, J. do not specifically disclose this invention practiced with this polymer. It

would have been obvious experimentation to one of ordinary skilled in the art to practice this invention with this polymer.

Burke, N. and Guillet, J. disclose free radicals generated radiochemically using gamma rays from a cobalt-60 source. Krässig et al. teaches "high energy radiation, such as gamma rays from radioactive isotopes as from Co-60 or others, or as highly accelerated electrons from industrially build accelerators, are able to create excited site in organic compounds, which in interactions, not known so far in details, can lead to radical sites". See Krässig, page 419, right column, lines 46-50 and page 420, left column, lines 1-2. It would have been obvious to try to one of ordinary skilled in the art to practice the invention of Burke, N. and Guillet, J. with "highly accelerated electrons", or an electron beam, as the radiochemical source in place of gamma rays from Co-60 to give a dose of 2 Mrads with a reasonable expectation of success.

Claims 1 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward et al. (Surface Science, 1978, p257-273, cited in PTO-892) in view of Demott (US patent 3,558,596).

Ward et al. disclose the use of cold plasma to generate free radical active centers within the cellulose matrix of cotton cellulose in the form of fibers in cotton print cloth. See Ward et al., page 258, lines 2-5, 14, and 25. Ward et al. further disclose the radicals can react absent the radical source, "polymerizations can be initiated either by the simultaneous presence of monomer and cotton fabric in the plasma, or by direct contact between previously activated cotton and monomers." Ward et al. disclose the

reaction between styrene, a functionalized olefin, and cellulose, and the product formed thereof. See Ward et al., page 271, lines 3, 4, 6, 7, and 18 and table 9, entry 3. Ward et al. further disclose that the stable radical has a half-life of about 1 day, "the singlet remains even after 24 h exposure to room atmosphere, showing that the radical is long-lived." See Ward et al., page 266, lines 6-9.

Demott discloses the preparation of cellulosic materials reacted with a functionalized olefin, vinyl phosphonate, using a free radical reaction. See Demott, column 1 lines 39-40, column 2 lines 53-59. Demott discloses the use of cellulosic material as "The invention is of particular use in the textile industry in that the vinylphosphonate additionally imparts permanent-press as well as fire-resistance to cellulosic fabrics and to fabric blends of cellulosic fibers and fibers of wool, polyester, rayon, nylon [a polyamide], or other like synthetic fibers. Such fabric blends are well known and widely used in the art." See Demott, column 2, lines 17-20.

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teaching by Demott of fabric blends incorporating the functionalized cellulosic material to the functionalized cellulose in the form of fibers in cotton print cloth disclosed by Ward et al. As taught by Demott, "Such fabric blends are well known and widely used in the art."

Conclusion

No claim is found to be allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan S. Lau whose telephone number is 571-270-

3531. The examiner can normally be reached on Monday - Thursday, 9 am - 4 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisors, Ardin Marschel can be reached on 571-272-0718 or Cecilia Tsang can be reached on (571)272-0562. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ardin H Marschel 8/20/07

JSL

ARDIN H. MARSCHEL
SUPERVISORY PATENT EXAMINER